

AMENDMENTS TO THE CLAIMS:

This listing of the claims will replace all prior versions, and listings, of the claims in this application.

Listing of Claims:

1. (Currently Amended) ~~A positioning~~ An image projection system comprising,

a projection unit that comprises an image projector, said projection unit having an input configured to receive data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted;

at least one mount for mounting a said projection unit, ~~the projection unit comprising at least a projector for receiving a distorted image generated by a display controller and for projecting the distorted image; and~~

~~where the at least one mount is coupled to a mechanism~~ coupled with said mount for providing translational movement and rotational movement for adjusting changing at least one of a position and an orientation of the projection unit in three dimensional space;

where said data representing an image that is predistorted is varied in accordance with a current position and orientation of said projection unit in three dimensional space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted.

~~to produce from the distorted image a substantially undistorted image on a surface, and wherein the translational movement comprises components in at least two perpendicular directions.~~
2. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the projection unit comprises a redirection device.
3. (Currently Amended) The ~~positioning~~ image projection system as in claim 2, wherein the redirection device comprises a mirror.

4. (Currently Amended) The ~~positioning~~ image projection system as in claim 2, wherein the redirection device comprises at least one of a lens, an optical fiber and a prism.
5. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the at least one image projector is coupled to a controller for generating the distorted image.
6. (Currently Amended) The ~~positioning~~ image projection system as in claim 5, wherein the controller comprises one of a remote controller, a controller integrated with the projection unit and a controller mounted with the projection unit.
7. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein one of the distorted image and the substantially undistorted image comprise an interactive region for a user interaction.
8. (Currently Amended) The ~~positioning~~ image projection system as in claim 7, wherein the user interaction comprises an instruction for operation of external equipment.
9. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein one of the mount and at least another mount is adapted for mounting an interaction recognition system.
10. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the projection unit comprises an interaction recognition system.
11. (Currently Amended) The ~~positioning~~ image projection system as in claim 9, wherein the interaction recognition system comprises an apparatus for detecting a user interaction.
12. (Currently Amended) The ~~positioning~~ image projection system as in claim 9, wherein the interaction recognition system comprises at least one camera.
13. (Currently Amended) The ~~positioning~~ image projection system as in claim 9, wherein the interaction recognition system comprises a voice recognition system.

14. (Cancelled)

15. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the mechanism is comprised of at least one of a telescoping mount, a scissors lift, an articulating arm, a kinematic device and a rail system.

16. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the mechanism is adapted for attaching to a fixed support.

17. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, comprising a positioning controller for controlling the position of the at least one image projector.

18. (Currently Amended) The ~~positioning~~ image projection system as in claim 17, wherein the positioning controller comprises a source of geometric model information.

19. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, comprising tracking and sensing equipment for identifying a position for the at least one image projector.

20. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the system is adapted for positioning the at least one image projector with two degrees of freedom.

21. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the system is adapted for positioning the at least one image projector with three degrees of freedom.

22. (Currently Amended) The ~~positioning~~ image projection system as in claim 1, wherein the system is adapted for orienting the at least one image projector with two degrees of freedom.

23. (Currently Amended) The positioning image projection system as in claim 1, wherein the system is adapted for orienting the at least one image projector with three degrees of freedom.

24. (Currently Amended) A method ~~for providing a substantially undistorted image upon a surface, the method~~ comprising:

sensing a request from a user for a projection at a location;

receiving data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted ~~a distorted image generated by a display controller from an undistorted image;~~

selecting a projection unit comprised of at least a an image projector for projecting the distorted image and at least one mount for mounting the projection unit; and,

moving the at least one image projector by operating a mechanism coupled with said mount comprising the at least one image projector mounted on a moveable portion of the mechanism, where the mechanism is adapted for providing translational movement and rotational movement of the at least one image projector by changing at least one of a position and an orientation of the projection unit in three dimensional space; and,

varying the data representing the image in accordance with a current position and orientation of said projection unit in three dimensional space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted. ~~to provide the substantially undistorted image upon the surface at the location, and wherein the translational movement comprises components in at least two perpendicular directions.~~

25. (Original) The method as in claim 24, wherein sensing comprises identifying a request from at least one of equipment for automatically entering the request and equipment for manually entering the request.

26. (Original) The method as in claim 24, wherein operating the mechanism comprises one of manually operating the mechanism and automatically operating the mechanism.

27. (Original) The method as in claim 24, wherein positioning comprises locating the projection unit to provide for an image substantially free from occlusion.

28. (Currently Amended) The method as in claim 24, comprising coordinating position of the at least one image projector with a position of at least an interaction recognition system.

29. (Currently Amended) The method as in claim 24, comprising coordinating the position of the at least one image projector with a position of at least another image projector.

30. (Currently Amended) A method ~~for providing a substantially undistorted image upon a surface, the method~~ comprising:

sensing a request from a user for a projection at a location;

receiving data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted ~~a distorted image generated by a display controller from an undistorted image;~~

selecting a projection unit comprised of at least a an image projector for projecting the distorted image and at least one mount for mounting the projection unit; and,

moving the at least one image projector by operating a mechanism coupled with said mount comprising the at least one image projector mounted on a moveable portion of the mechanism, where the mechanism is adapted for providing translational movement and rotational movement of the at least one image projector by changing at least one of a position and an orientation of the projection unit in three dimensional space;

varying the data representing the image in accordance with a current position and orientation of said projection unit in three dimensional space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted ~~to provide the substantially undistorted image upon the surface at the location, and wherein the translational movement comprises components in at least two perpendicular directions; and,~~

coordinating the position of the at least one image projector with a position of at least another image projector wherein the projection unit produces a first portion of the distorted image and the at least another projection unit produces another portion of the distorted image.

31. (Currently Amended) A method for calibrating ~~a positioning~~ an image projection system for a projection unit comprised of at least a an image projector adapted for projecting

a distorted image, the positioning image projection system for providing a substantially undistorted image to a user, the method comprising:

receiving data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted;

loading a calibration image into the at least one image projector;

moving the at least one image projector to a location to project the calibration image upon a target surface, where the movement comprises at least rotational and translational movement by changing at least one of a position and orientation of the projection unit in three dimensional space;

varying the data representing the image in accordance with a current position and orientation of said projection unit in three dimensionally space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted, ~~and wherein the translational movement further comprises components in at least two perpendicular directions;~~

adjusting settings of the at least one image projector to produce a calibration image that is substantially undistorted upon the target surface;

recording the settings for the at least one image projector at the location;

associating the settings with the target surface to produce a set of geometric model data;

storing the set of geometric model data; and,

repeating the loading, moving, adjusting, recording, associating and storing for a plurality of positions of the at least one image projector.

32. (Currently Amended) A method to provide a substantially undistorted image upon a surface at a location, the method comprising:

receiving data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted;

providing a projection unit coupled to a positioning system, the projection unit comprised of at least a an image projector for providing an image;

loading setting layout information into a positioning controller for operating the positioning system;

positioning the at least one image projector at a location by referring to the setting layout information, where the positioning comprises at least rotational and

translational movement ~~in~~ by changing at least one of a position and an orientation of the projection unit in three dimensional space, and wherein the translational movement further comprises components in at least two perpendicular directions;

varying the data representing the image in accordance with a current position and orientation of said projection unit in three dimensionally space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted;

referring to the setting layout information to determine projection settings for the at least one image projector; and,

adjusting the settings of the at least one image projector to the projection settings to produce the image upon the surface.

33. (Currently Amended) A method for adjusting at least one input setting of an interaction recognition system coupled to ~~a positioning~~ an image projection system, the method comprising:

providing a positioning system comprising at least one mount adapted for mounting a projection unit comprising at least a an image projector and at least one other mount for positioning the interaction recognition system, where the interaction recognition system provides for a user input in response to an image projected by the projection unit, and wherein the mount adapted for mounting a projection unit is configured to provide at least rotational and translational movement of the image projector by changing at least one of a position and an orientation of the projection unit in three dimensional space, and wherein the translational movement further comprises components in at least two perpendicular directions;

loading area layout information into a positioning controller for operating the ~~positioning~~ image projection system;

positioning the interaction recognition system at a location by referring to the area layout information;

referring to the area layout information to optimize the at least one input setting for the interaction recognition system; and,

adjusting the at least one input setting of the interaction recognition system.

34. (Currently Amended) A computer program stored on a computer readable media, the program comprising instructions for positioning a projection unit to produce a substantially undistorted image, the instructions for:

receiving data representing an image that is predistorted such that, when projected upon a surface, the resulting image is substantially undistorted;

sensing a request from a user for production of an image at a location;

receiving a distorted image generated from a non-distorted image; and

positioning the projection unit to provide the substantially undistorted image upon a surface at the location, where positioning comprises referring to a stored geometric model for the location to produce the substantially undistorted image in accordance with the geometric model and moving the projection unit rotationally and translationally by changing at least one of a position and an orientation of the projection unit in three dimensional space; and,

varying the data representing the image in accordance with a current position and orientation of said projection unit in three dimensionally space such that a resulting image projected on a surface from the current position and orientation of the projection unit is substantially undistorted, ~~wherein the translational movement comprises components in at least two perpendicular directions.~~

35. (Currently Amended) ~~A positioning~~ An image projection system, comprising:

mounting means for mounting a projection means comprised of at least an image projecting means for projecting a distorted image generated by a display controller from a non-distorted image; where the mounting means is coupled to positioning means for providing translational movement and rotational movement by changing at least one of a position and orientation of the projection means in three dimensional space to produce a substantially undistorted image from the distorted image, ~~and wherein the translational movement comprises components in at least two perpendicular directions.~~

36. (Currently Amended) The ~~positioning~~ image projection system as in claim 35, wherein the positioning means comprises means for moving the image projecting means through a range of movement comprising between two degrees of freedom and six degrees of freedom.

37. (Currently Amended) ~~A projection~~ An image projection system, comprising:

at least one projection unit comprised of at least a an image projector for projecting a distorted image, where the distorted image is generated by a display controller from a non-distorted image, the at least one image projector mounted to at least one mount that is coupled to a mechanism providing translational movement and rotational movement by changing at least one of a position and an orientation of the projection unit in three dimensional space for positioning the at least one image projector to produce a substantially undistorted image from the distorted image, ~~wherein the translational movement is comprised of components in at least two perpendicular directions.~~

38. (Cancelled)

39. (Currently Amended) The image projection system as in claim 37, wherein one of the substantially undistorted image and the distorted image comprises an interactive region.

40. (Previously Presented) An image projection system comprising a controller coupled to a positioning apparatus for positioning a projection unit in three-dimensional space, the system for producing a substantially undistorted image from a projected distorted image at a specified location, the distorted image generated from a non-distorted image prior to projection, the controller being responsive to a stored geometric model for the location to cause the projection unit to provide the substantially undistorted image by changing at least one of a position and an orientation of the projection unit in three dimensional space ; ~~wherein the positioning comprises translational movement further comprising movement components in at least two perpendicular directions.~~